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a digest of timely information

Editor - Captain F. W. Farrar. (MC). U.S.N.

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Points of Importance in the Use of PABA in Human Rickettsial Infections:

From 1943 to 1945 large amounts of para-aminobenzoic acid (PABA) were administered to 95 typhus patients of various nationalities. Twenty of the 95 patients were Egyptian males observed in a controlled study in which treatment was begun before the eighth day of illness. Analysis of the results showed statistically significant differences between the PABA-treated and -untreated groups as regards duration of fever, incidence of complications, and mortality. The authors are convinced that the drug definitely lessened the severity of the illness when treatment was begun early in the course of the disease and when sufficiently large amounts were given to produce an adequate concentration of the drug in the blood during the entire period of therapy. Moreover, the pathologic material from four fatal cases of typhus treated with PABA showed no lesions which were regarded as evidence of poisoning with the drug. In one fatal case nephrosis of uncertain etiology was present.

On the basis of the experience with PABA in the treatment of these patients and 18 patients with tsutsugamushi disease, the following important points in the administration of this substance in human rickettsial infections are made:

Importance of Early Treatment. Good results are to be expected from PABA treatment only when therapy is begun early in the clinical course of typhus fever or tsutsugamushi disease. Little or no benefit from therapy is likely to be observed when treatment is started after the eighth day of illness. Epidemiologic considerations may be of great value in making a presumptive diagnosis and in starting treatment before the characteristic rash appears or before the usual serologic tests give any help in diagnosis. When the suspicion of a rickettsial infection exists, in the absence of the contraindications mentioned in a later paragraph, it is recommended that PABA therapy be initiated without delay.

Optimum Concentration of PABA. It is impossible to state from clinical experience precisely what the optimum concentration of PABA should be for the various rickettsial infections. Some of the PABA is converted in the body to para-aminohippuric acid, which has been found to be entirely inert against R. prowazeki, R. mooseri, and R. orientalis in experimental infections. Analyses made with Mirick's soil bacillus in a few instances suggested that free PABA accounted for about four fifths of the diazotizable substances in the serum of patients when the total concentration was from 15 to 20 mg. per 100 c.c. It has been observed repeatedly that the minimum concentration of PABA required to achieve inhibition of multiplication in embryonated eggs is approximately 5 mg. per 100 c.c. for R. prowazeki and R. mooseri, but that a concentration of at least 35 mg. per 100 c.c. is required to inhibit the multiplication of R. orientalis.

In the absence of more accurate information, it is recommended that sufficient PABA be given to attain promptly, and to maintain thereafter for the entire period of therapy, a blood concentration of PABA (as free diazotizable substance measured against a standard of PABA) of from 10 to 20 mg. per 100 c.c. for

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patients suffering from typhus fever, and from 35 to 40 mg. per 100 c.c. for patients suffering from tsutsugamushi disease or Rocky Mountain spotted fever.

Form of PABA. The PABA should be chemically pure, either as the acid or the sodium salt. The pure compounds are almost entirely colorless and odorless in powder form. In solution a faintly brownish color may be present. At least equimolar amounts of sodium bicarbonate should be given with each dose of the free acid (12.5 c.c. of a 5-percent solution of sodium bicarbonate for each gram of PABA). The amount of bicarbonate should be increased as required to maintain the urine neutral or alkaline in reaction. In most instances it has been the practice of the authors to mix the powder (acid PABA) with 5-percent solution of sodium bicarbonate at the bedside immediately before each dose. After drinking this mixture the patients received 100 c.c. or more of water.

One of the authors (J. C. S.) with Dr. E. C. Curnen has used a 10-percent solution of the sodium salt of para-aminobenzoic acid, adjusted to a pH of 7.0 for treatment of a patient suffering from typhus which was contracted in the laboratory. This form of administration eliminated the necessity of mixing the powdered PABA with 5-percent sodium bicarbonate solution before each dose. The 10-percent solution of the sodium salt was made up in bulk and stored in the cold. The patient who received this form of therapy preferred it to the mixture of acid PABA and bicarbonate solution. When sodium para-aminobenzoate solution was administered, no bicarbonate solution was necessary unless the urine became acid.

The Schedule of Dosage. Since PABA is rapidly excreted in the urine it is necessary to administer this drug at frequent intervals throughout the 24-hour period. After many trials the most satisfactory schedule for oral administration was found to be an initial dose of roughly 0.05 Gm. per pound of body weight, i.e., 8 Gm. for a patient weighing 160 pounds, followed by a dose of from 1 to 3 Gm. every two hours day and night throughout the course of treatment. It is imperative to measure the blood concentration at frequent intervals, particularly in cases where appreciable fluctuations in fluid intake and urine output occur from day to day, or in patients with azotemia. In this study, whenever circumstances permitted, the blood concentration was measured every four hours for the first 24 hours of treatment. For determination of blood levels, venipunctures were performed just prior to a dose of the drug, that is, two hours following the last dose. Since the blood concentration rises and falls rapidly after each dose of PABA, measurements of the blood concentration two hours after the previous dose represent the lowest concentrations during that interval. Although in some patients it may be desirable to continue measurements of the blood concentration of the drug at intervals of four hours throughout the course of treatment, this usually is not necessary, provided that renal insufficiency is not present, that the urine output and fluid intake are reasonably constant from day to day, and that the two-hour schedule of dosage is strictly observed. Satisfactory blood levels can be maintained after the first 24 hours of treatment by measuring the blood concentration just before each 8:00 a. m. dose. Evidence obtained in the treatment of experimental rickettsial infections

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has shown that the most important factor in successful treatment is the maintenance of the concentration of PABA consistently at or above 10 mg. per 100 c.c. of blood for R. prowazeki, or 35 mg. per 100 c.c. for R. orientalis. Because of this fact, and because of the rapid elimination of the drug from the body, it is advised that frequent determinations be made throughout the entire course of treatment in order to adjust the dosage as required to attain effective blood concentrations.

Parenteral Administration. Injections of 25 c.c. of a 20-percent solution of sodium para-aminobenzoate in physiological saline adjusted to a pH of 7.0 were given intramuscularly to several patients at intervals of four hours. This solution was sterilized by filtering through a Seitz filter. Determinations of the blood concentration at intervals of two hours in these patients showed somewhat erratic values. This method of administration, although well tolerated, was not considered as successful as the oral route.

The administration of chemically pure sodium para-aminobenzoate in a solution of from 2 to 5 per cent in physiological saline by constant intravenous drip may be considered for patients who cannot take the drug by mouth. In four patients (at the Dachau Concentration Camp in Germany), when a constant rate of flow over the 24-hour period was achieved, the fluctuation in the blood concentration of the drug was negligible. The rate of flow was adjusted to permit the infusion of from 25 to 30 Gm. of the drug in 24 hours. The difficulties encountered by the intravenous form of therapy were chiefly those attendant upon any prolonged intravenous infusion under field conditions. Under more satisfactory hospital conditions, it is believed that the intravenous administration of pyrogen-free buffered solutions of chemically pure sodium para-aminobenzoate would be a valuable adjunct to oral therapy for certain patients.

Duration of Treatment. In the absence of complications arising during treatment, the administration of PABA to patients with rickettsial infections should be continued until the temperature has been normal for at least 48 hours. If the drug is stopped before this time in the treatment of typhus, a secondary rise in temperature lasting from a few hours to several days may be encountered. In the absence of obvious complications this secondary febrile period probably represents a mild recrudescence of the disease. Premature withdrawal of the drug in the treatment of tsutsugamushi disease was followed by the recurrence of fever and characteristic lymphadenopathy.

The Importance of Reaction of the Urine during Treatment. The administration of large amounts of PABA to patients whose urine is acid in reaction may result in precipitation of crystals of PABA in the kidney tubules. Therefore, it must be emphasized strongly that whenever this compound is given, steps must be taken to insure alkaline or neutral reactions in the urine. The pH of the urine should be tested at least twice daily as long as patients have measurable concentration of the drug in the blood. Usually it has been found that when from 13 to 20 c.c. of a 5-percent solution of sodium bicarbonate is given with each gram of PABA, the pH of the urine will remain

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at 7.0 or higher. In some cases, however, it may be necessary to increase the amount of bicarbonate solution in order to render the urine neutral or alkaline in reaction. This is particularly the case in patients with azotemia. Under the regimen of bicarbonate administration outlined above, crystals were not found in the urine of patients treated with PABA. Signs of renal involvement, such as azotemia or hematuria, were less frequent and less severe in the treated than in the untreated typhus patients.

The Treatment of Secondary Bacterial Infections in Patients Receiving PABA Therapy. The authors believe that the presence of secondary bacterial infections does not contraindicate PABA therapy. The choice of chemotherapeutic agents for the treatment of complicating bacterial infections during PABA therapy is important. Sulfonamide drugs appear to exert a deleterious effect in experimental rickettsial infections. The action of these drugs on bacteria is inhibited in vitro by the presence of even moderate concentrations of PABA. Sulfonamides should not be employed during the acute febrile phase of the rickettsial disease (first 14 days after clinical onset) or in the presence of measurable concentrations of PABA in the blood. Penicillin is the drug of choice if organisms susceptible to its action are the cause of bacterial infections in typhus or tsutsugamushi disease. Penicillin should be used to supplement but not to replace PABA.

The White Blood Cell Count. The occurrence of leukopenia in some typhus patients treated with PABA makes it necessary to count the white blood cells at frequent intervals during the course of therapy. It is recommended that white cell counts be performed on every patient daily from the start of therapy until the third or fourth day after treatment is discontinued. When counts fall below 3,000, the percentage of polymorphonuclear leukocytes should be ascertained.

Contraindications to Treatment with PABA. Until additional experience is gained from the therapeutic use of PABA it is suggested that the fall of the white blood cell count below 3,000 per cu. mm., or the reduction of polymorphonuclear leukocytes to less than 25 per cent during treatment be regarded as a contraindication to further therapy. In each case the clinician must decide whether a falling white count would be more hazardous to the patient than the withdrawal of the inhibiting effect of PABA on the rickettsiae.

If PABA crystals appear in the urine, the administration of the drug should be stopped at once.

Considerable care should be exercised in giving PABA by mouth to patients who are too weak to swallow properly. Aspiration of PABA may be followed by severe tracheobronchitis.

PABA therapy probably is not indicated for typhus patients under 40 years of age who have been adequately vaccinated, except for those whose clinical condition at the time of hospitalization suggests that they will become severely

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ill. In cases of suspected tsutsugamushi disease PABA should be administered regardless of a history of previous vaccination, since there is no evidence that vaccines prepared from R. orientalis have any effect on the course of the disease in humans.

In the opinion of the authors, the presence of renal insufficiency prior to treatment, or its appearance during the course of therapy is not a reason for withholding or discontinuing PABA provided that the blood concentration is determined frequently, that adjustments in dosage are made accordingly, and that the urine is neutral or alkaline in reaction. (Ann. Int. Med., July '47 - J. C. Snyder et al.)

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Poliomyelitis in Relation to Tonsillectomy: A recent paper on the topic of poliomyelitis and tonsillectomy advocated a nationwide survey on the part of otolaryngologists to determine the incidence of poliomyelitis following tonsillectomy.

This study began as a part of that survey and expanded in scope as the material became available. The study was limited to the files of the San Francisco City and County Hospital and the Children's Hospital of the same city. All facilities for hospitalization of poliomyelitis cases in the city of San Francisco are centered in the contagion wards of these two hospitals. It was thought that a representative period for study should include an epidemic and an interepidemic period, if possible, with no break in yearly sequence. The period from 1941 to 1945, inclusive, seemed appropriate and was therefore selected for study. The material gathered from the files of the two hospitals covered the following points:

1. Age.
2. Address.
3. Date of onset of poliomyelitis.
4. Type of poliomyelitis: bulbar, bulbospinal, spinal, or nonparalytic.
5. Any operation performed during a two-month period before onset of disease.
6. Outcome: recovery, paralysis, or death.

In those instances in which doubt existed concerning the authenticity of the data sought, the case was omitted from this study.

In a further effort to correlate the material gathered herein, an attempt was made to ascertain the number of tonsillectomies performed during the same period. A form letter was directed to hospitals in 34 counties in which the cases of poliomyelitis had originated. Out of 96 letters mailed out, 63 replies were received. No attempt was made to contact physicians to determine the number of patients operated upon in their own offices. From the replies

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received, the numbers of tonsillectomies and adenoidectomies performed for the five-year period were tabulated as follows:

1941: 11,301	1943: 8,910	
1942: 12,406	1944: 12,889	1945: 12,290

Thus, 57,796 known operations were performed during the five-year period from 1941 to 1945, inclusive.

For the same 34 counties, 2,057 cases of poliomyelitis were reported to the California State Department of Public Health as follows:

1941: 58	1943: 1,275	
1942: 52	1944: 177	1945: 495

The population for the 34 counties covered in this study was listed as approximately 2,500,000 by the United States Census of 1940. Thus, during the greatest epidemic year, 1943, the incidence of poliomyelitis in the general population was approximately 1 in 1,960, and the incidence of poliomyelitis in the 8,910 persons who had tonsillectomy the same year was approximately 1 in 1,782.

During the five-year period, from 1941 to 1945, 492 patients with poliomyelitis were hospitalized in the two hospitals covered in this study. The majority of these 492 cases occurred (1) in the epidemic years of 1943 and 1945; (2) in children of the ages from 2 to 9, with the greatest number, 40, at age 8; and (3) in the seven-month period, from June to December, with 36 cases in June; 73 in July; 79 in August; 80 in September; 81 in October; 71 in November; and 24 in December. Of these 492 cases, 354 were recorded according to the known presence (206) or absence (148) of tonsils before onset of the disease. The cases were catalogued by clinical type, with the outcome also indicated regarding full recovery, paralysis, or death. Undoubtedly, the number of paralytics was reduced as time went on, but the figures represent the available information at the time of discharge. In the group with tonsils present there were 99 full recoveries, 101 with paralysis, and 6 deaths; in the group with tonsils absent there were 25 full recoveries, 112 with paralysis, and 11 deaths. There were 11 cases of bulbar and bulbospinal type of disease in the group with tonsils present. There were 24 cases of bulbar and bulbospinal type poliomyelitis in the group with tonsils removed.

Of the 492 cases reviewed in this series, there were 11 cases of poliomyelitis following tonsillectomy within a two-months period. The longest interval between operation and onset of poliomyelitis was 60 days, the shortest being 7 days. In 7 of these cases tonsillectomy was performed within the probable period of incubation. Of these 11 cases, 6 were of bulbar and bulbospinal type.

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There were 4 cases of the spinal type and one case was classified as unknown by type. Of these 11 patients, 7 were males and 4 were females. The oldest patient was nine years of age and the youngest three years of age. There were no deaths in the cases of poliomyelitis that followed tonsillectomy within 60 days.

Conclusions. The incidence of poliomyelitis in the general population in an epidemic year (1943) was 1 in 1,960, and the incidence of poliomyelitis following tonsillectomy for the same period was 1 in 1,782 (5 cases in 8,910 known tonsillectomies). Thus, the incidence of poliomyelitis following recent tonsillectomy is not greatly out of proportion to that in the general population during an epidemic year. When poliomyelitis occurs following tonsillectomy, it is more apt to be bulbar in type. There is a higher incidence of bulbar and bulbospinal type poliomyelitis in tonsillectomized patients than in nontonsillectomized patients, the ratio being two to one. (Ann. Otol., Rhin., and Laryng., June '47 - P. M. Pedersen)

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Nondrainage, Chemotherapy, and Early Ambulation in Cases of Perforative Appendicitis: This paper reports a study of 15 cases of perforative appendicitis with peritonitis or abscess formation in which the appendix was removed, sulfathiazole was employed intraperitoneally, and the incision was closed without drainage. Spinal anesthesia and early ambulation were used. There were no deaths; a secondary intraperitoneal abscess requiring drainage occurred in 1 case. There were no other complications and no purulent wound infections. Penicillin was administered in the last 7 cases.

From this small series of cases the author concludes that nondrainage in cases of perforative appendicitis with peritonitis is preferable to drainage; that it is safe, and is desirable because it eliminates prolonged drainage and wound infection and minimizes the hazard of such postoperative sequelae as adhesions, hernia, fistula, and obstruction; and that nondrainage shortens the stay in the hospital, saves dressings and bandages, lessens expense to the patient and lowers mortality.

The excellent results obtained by the author with the intraperitoneal use of sulfathiazole over a period of five years confirm the experimental work of Throckmorton, who concluded that sulfathiazole is a specific against a large number of micro-organisms, that it is relatively innocuous to the peritoneum, that it has prolonged bacteriostatic effect and that it stimulates a desirable local response.

Early ambulation in these cases of perforative appendicitis, despite ileus, peritonitis and fever, was found to be just as satisfactory and desirable as in cases of other types of abdominal surgery, and the necessity for intravenous infusions, duodenal suction, catheterization, and enemas was decreased.

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Primary closure in cases of ruptured appendix is neither a new nor a radical procedure. Before the advent of the sulfonamide drugs or penicillin, several surgeons reported successful results with this method. Thus, Cottis and Ingham, in 1935, reported a series of cases of localized and diffuse peritonitis, in 28 of which drainage was employed, with 9 deaths, and in 26 of which drainage was not employed, with 3 deaths. Thus, there was a mortality of 32.15 per cent in the cases with drainage and of 11.11 per cent in the cases without drainage. Cafritz found that nondrainage resulted in less mortality and less morbidity; it minimized postoperative mechanical ileus, shortened the duration of illness, lessened the tendency to postoperative hernia, excluded the possibility of development of fistula and minimized the tendency to postoperative adhesions. In 1939 Pickell reported a series of 30 cases of spreading and generalized peritonitis, in only 1 of which a drain was used. There were 3 deaths. In the same year Warren compared results in a series of 91 cases with drainage and 25 similar cases without drainage. He concluded that a drain was the most important factor in the causation of fistula. In the entire series there was not a single case, with or without drainage, in which the wound did not show some evidence of infection; in 17.5 per cent of cases with drainage and in 60 per cent without drainage there was some evidence of secondary abscess formation.

In 1939 Collins studied a series of 496 cases of perforated appendix with abscess formation in Los Angeles hospitals and concluded that spinal anesthesia was the safest of all types, resulting in a 12.6 per cent reduction in mortality over all other forms of anesthesia.

In 1944 Davison and Letton reported that with the intraperitoneal use of the sulfonamide drugs they had lessened the average stay of the patient in the hospital almost six days.

It is apparent that the mortality rate for the cases without drainage was lower than that for the cases in which drainage was employed. However, even in the cases without drainage the mortality rates were from 11 to 17 per cent.

Although there are only 15 cases in the series reported by the author in which no drainage was employed, there were no deaths and only 1 case of secondary abscess formation. The better results in this series must, he believes, be attributed to the use of chemotherapy. All wounds were closed as with a nonperforated appendix, and only a "mediplast" dressing (an elastic adhesive bandage with a central gauze compress) was applied. This brings up a point for discussion, for Meyer and Ochsner and their associates have stated that it is imperative that drainage of the peritoneal wall be employed. This has proved unnecessary with the method which the author and colleagues have used since 1941, when they began to use intraperitoneally approximately 10 Gm. of sulfathiazole powder (not crystals) in 1/2 pint (250 c.c.) of warm isotonic solution of sodium chloride. This is poured into the abdominal cavity, and the

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operating table is then tilted in all directions, so that the solution is carried from the diaphragm to the pelvis and from side to side. In closing the wound, no attempt is made to aspirate the solution, which is allowed to infiltrate the various layers. In addition, sulfathiazole powder is lightly dusted into all layers of the wound. The wound is closed with fine, interrupted and continuous, chromic surgical gut sutures. When the use of early ambulation was begun in these cases and in other cases of abdominal and pelvic surgery, fine tantulum wire was employed, but this has been given up. The author is convinced that early ambulation, and not the type of incision or suture material, is an important factor in satisfactory wound healing. Employment of sulfathiazole powder dusted lightly into all incisions for the past five years has virtually eliminated infections of wounds.

Dees probably was the first to use a sulfonamide drug intraperitoneally, and the Roosevelt Hospital group, in New York, popularized the method in 1941. They have always advocated the use of sulfanilamide locally. Early in their experience the author and colleagues, believing the single large intraperitoneal dose to be the most effective, discontinued the oral, subcutaneous, and intravenous use of the sulfonamide compounds.

When penicillin became available, it was employed in 30,000-unit doses every three hours, or in 300,000-unit doses in beeswax daily. Recently, Crile reported a series of 50 cases of proved peritonitis of appendical origin in which penicillin was given in 100,000-unit doses intramuscularly every two hours for from two to six days, and but 1 death, from mesenteric thrombosis, occurred. In cases of spreading peritonitis the infection was controlled with penicillin. In no case was it necessary to drain an intraperitoneal abscess, and there was no spontaneous drainage into the bowel.

In the cases reported upon here, it was not obvious that the additional use of penicillin materially altered the progress, and it had no apparent effect in the case of secondary abscess. However, the maximum dose of penicillin employed in this series was 300,000 units in twenty-four hours, in contrast to 1,200,000 units used in Doctor Crile's series.

The problem of anesthesia seems to be largely a question of preference; however, after the routine use of spinal anesthesia in abdominal surgery since 1928, the author feels that it has definitely decreased the incidence of complications and has been a factor in the absence of deaths in this series.

Meyer and associates, in a review of cases of appendicitis at Cook County Hospital, stated that in cases of appendectomy without drainage the mortality rate was much lower than in similar cases with drainage, that chemotherapy is largely responsible for the lowering of the mortality rate, from 26.4 to 13.9 per cent, and that spinal anesthesia is the method of choice.

Finally, a composite study of the views of 150 members of the Western Surgical Association on the principal points discussed in this paper, namely,

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drainage and chemotherapy, is presented.

Replies to the questionnaire were received from 173 members, 23 of whom were surgeons specializing in other fields, or are no longer active. Thus, the replies of 150 were available for this study. Eighty-one members stated that they employed drainage; 38, that they do not use drainage; 17, that they rarely use drainage; 9, that they drain only if an abscess is present, and 5, that they drain only to the peritoneal wall. Sixty-nine are therefore opposed to drainage with the opinion fairly evenly divided on this subject. Several said, however, that they are beginning to abandon drainage.

Concerning the type of drain used, 76 stated that they favor the Penrose type, 12 the cigarette type, 14 a rubber tissue, and 7 a rubber tube. Forty-two expressed no opinion.

Ninety stated that they favor the use of a sulfonamide drug within the peritoneal cavity, and 60 that they oppose it; 47 use sulfanilamide, 35 sulfathiazole, 9 sulfadiazine, and 1 succinylsulfathiazole. In addition to the use of a sulfonamide in the peritoneal cavity, 93 stated that they favor the use of a sulfonamide drug by other methods and 43 that they oppose it, and 26 expressed no opinion.

Only 13 stated that they use penicillin within the peritoneal cavity; 137 had had no experience with this method. However, 119 were using penicillin by other methods; 26 expressed no opinion on this point, and 5 were using streptomycin. (Arch. Surg., June '47 - A. S. Jackson)

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Radioactive Phosphorus as an External Therapeutic Agent in Basal Cell Carcinoma, Warts, and Hemangioma: The purpose of this report is to demonstrate that artificially radioactivated phosphorus, as a pure beta particle radiator, can be used satisfactorily in the treatment of superficial skin diseases and to emphasize the usefulness of one of the many by-products of the chain-reacting piles established for the production of plutonium and uranium 235. It is true that there are other well established methods of treatment of skin diseases which have proved satisfactory, such as low kilovoltage roentgen rays, surface surgery, etc.

Since the discovery of natural radioactivity and the recognition of cathode rays as high speed beta particles, attempts have been made repeatedly to utilize beta radiation in the treatment of skin diseases. It has long been appreciated that beta radiation is particularly suitable for the treatment of superficial lesions of the skin, because beta rays penetrate the skin to a depth of only a few millimeters, thus reaching all layers of the skin without penetrating to deeper structures. It is also known that the general biological effect of beta rays is similar to that of other ionizing radiations such as roentgen rays or gamma rays, that is, when beta rays are applied in sufficient quantity they are capable of destroying

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living cells. Until the discovery of artificial radioactivity, available sources of beta radiation were either naturally occurring radioactive substances or specially constructed cathode-ray tubes. Neither of these sources, however, provides pure beta radiation. The lag in the development and establishment of beta radiation therapy has been due in large part to this fact, although the complex problem of dosage, and the primary interest in the therapeutic use of gamma rays have contributed to delaying progress in this field.

The discovery of artificial radioactivity has made available substances which radiate beta particles only. Radioactive phosphorus (P^{32}) is one such substance. P^{32} disintegrates at a daily rate of 4.8 per cent and thus loses one half of its initial activity in 14.3 days. The maximum penetration of P^{32} beta particles in water or tissue is approximately 8 mm. It must be realized, however, that the energy of the P^{32} beta particles varies from zero electron volts to 1.69×10^6 e.v.; therefore only a relatively small percentage actually penetrates to the 8 mm. depth. Absorption measurements have shown that approximately 48 per cent of the radiation from P^{32} is absorbed in the first millimeter of water or tissue. The radioactive phosphorus which has been used in these studies is an aqueous solution of disodium hydrogen phosphate containing 15 mg. of the salt per cubic centimeter of water.

The present studies were started in 1941 and after an interruption of one year were resumed in 1943. Despite the obvious possibilities of using P^{32} solution for external application to the skin, difficulties were encountered in developing a technic which would insure exactly reproducible exposures and reactions. After experimentation with absorbent cotton, vaseline, lanolin, blotting paper, gum acacia, higher alcohols and other substances, it was found that ordinary thin blotting paper is a most suitable vehicle. Blotting paper of known dimensions soaked in measured amounts of radioactive Na_2HPO_4 solution, and dried, can be applied easily to any part of the skin.

Office-type blotting paper 0.4 mm. thick and weighing 21 mg. per square centimeter is cut to size to cover the lesion and to allow a safety margin from 0.3 to 1.0 cm., depending upon the type of lesion. The blotting paper is backed by some kind of adhesive tape, and placed on a good drying surface such as a radiator or electric plate at low heat. A measured amount of P^{32} solution is then soaked into the blotting paper which is left to dry. When completely prepared, the blotting paper is applied over the skin lesion to be treated and secured in place, if necessary, with additional adhesive tape. It is left in place for a sufficient time to provide the desirable exposure for the condition under treatment. The exposure is calculated in microcurie hours per square centimeter, since the reaction obtained will be a function of the area over which radiation is distributed and of the time of exposure. It was found that the distribution of P^{32} solution in blotting paper of the sizes used in the studies is uniform.

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Once a technic had been established, the first question to consider was the development of erythema as a biological measure of the effect of P^{32} beta radiation on the skin. It was found that the minimum exposure which produces a faint but discernible "threshold" erythema is 34 microcurie hours per square centimeter. Subsequent studies have shown that the intensity of the skin reaction increases with the exposure.

During the period from March, 1943, to October, 1945, 301 skin lesions were treated by external local application of P^{32}. Since October, 1945, some 100 additional lesions have been treated but these are omitted from the present report because of the shortness of the observation period.

The table below shows the various types of lesions treated, and the outcome of treatment.

Type of Lesion	Number of Lesions	Number of Treatments Required					Recurrence	No Conclusion. Patient Did not Return	Lesion Disappeared	Percentage of Lesions Disappeared
		1	2	3	4	5				
Basal cell carcinoma[1]	52	46	4	1*	1		1		51	98.0
Hyperkeratosis[2]	36	36							36	100
Verruca, hands[3]	132	104	13				6	9	117	88.6
Plantar wart[4]	50	44	3				2	1	47	94.0
Subungual wart[5]	16	12	3				1		15	93.6
Hemangioma[6]	17	3	2	4	4	2			2	

* Within two months.
[1] Three lesions were recurrences after curettement and desiccation; two lesions were recurrences after treatment with roentgen rays.
[2] One lesion was a recurrence after treatment with roentgen rays.
[3] Three lesions were recurrences after treatment with roentgen rays; one lesion a recurrence after treatment with acid.
[4] Two lesions were recurrences after surgery; two lesions were recurrences after treatment with roentgen rays.
[5] One lesion was a recurrence after treatment with roentgen rays.
[6] Two lesions disappeared (1944); fifteen lesions improved, still under observation.

All patients with hyperkeratosis or carcinoma were seen by at least two members of the Visible Tumor Clinic of the University of California Hospital. In all cases of carcinoma there was unanimous opinion concerning diagnosis. Biopsy was taken in most instances. When a patient had multiple lesions, biopsy was taken usually from only one lesion. The diagnosis of hyperkeratosis was based on clinical judgment alone, and it is possible that some of these lesions were malignant.

During the early stages of these studies, dosage of the radioactive phosphorus varied considerably among the patients treated. Observation of the reactions, and analysis of the different doses in relation to the therapeutic response has led to a pattern of dosage, shown in the following table, which is now being systematically employed.

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Lesion	Dosage	Lesion	Dosage
Warty basal cell carcinoma with pearly margins	5000 microcurie-hours per sq. cm. at *least* 0.5 cm. safety margin	Verruca vulgaris*	2500–4000 microcurie-hours per sq. cm.
Flat, scaly basal cell carcinoma	3500–4500 microcurie-hours per sq. cm. at least 1 cm. safety margin	Verruca plantaris†	3000–4500 microcurie-hours per sq. cm. depending on depth
Flat hyperkeratosis	3500–4000 microcurie-hours per sq. cm. 0.5 cm. safety margin	Subungual verruca**	4000–5000 microcurie-hours per sq. cm.
Warty hyperkeratosis	3000–4000 microcurie-hours per sq. cm. 0.3–0.5 cm. safety margin; repeat if necessary in 8 weeks	Hemangioma‡	300–600 microcurie-hours per sq. cm.

* Scrape off horny surface before treatment with P^{32}.
† Wide range of dosage due to variation in depth of lesion. If one treatment without success within 6 weeks, then repeat treatment after scraping off surface thoroughly.
** Nail should be cut as short as possible before P^{32} pad is applied.
‡ Repeat in monthly intervals depending on response.

Although the inadequacy of expressing the dose by giving the amount of the radioactivity of the radiating source and the time of exposure should be borne in mind, at present this seems to be the least confusing and misleading method for dosage determination. The ultimate aim is to express the dose in some unit which will reveal more about the energy dissipated in the tissues. The applicability of the unit "roentgen" to energy dissipated from beta radiation is debatable. Should existing questions be resolved in favor of using the "roentgen," it should be qualified by employing the term "beta roentgen" in order to indicate that the energy dissipated is derived from a beta-radiating source. (Am. J. Roentgenol., July '47 - B. V. A. Low-Beer)

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Kernicterus: With the advent of more detailed knowledge concerning the pathogenesis and treatment of erythroblastosis fetalis, interest has been focused on the possible untoward effects of a successful therapeutic regimen that may result in a live but helpless infant with kernicterus.

The term "kernicterus" was devised by Schmorl in 1903 in referring to what Orth had called "nuclear jaundice" in 1875. In 1932 Diamond and his colleagues linked together as a single entity the heretofore separate disease states of icterus gravis, congenital fetal hydrops, and congenital anemia of the newborn. The new entity was called "erythroblastosis fetalis." In 1933 Zimmerman and Yannet commented on the association between those children jaundiced by the second day of life who died by the fifth or sixth day with signs of involvement of the central nervous system and others who, after a similarly severe attack of neonatal jaundice, lived, only to show later mental retardation and symptoms associated with injuries to basal ganglions (i.e., spasticity of an

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extrapyramidal type, athetoid and choreiform movements, and emotional instability). They noted that in those children who showed kernicterus at autopsy there was discernible on microscopic section bile pigment in isolated nerve cells in the cerebral and cerebellar cortex as well as in the grossly icteric basal ganglions. They stated that an appreciable percentage of children who reveal the symptom complex of icterus gravis present evidence that may be taken as indicative of involvement of the central nervous system (convulsions, spasticity, irregular respirations, drowsiness, vomiting), and of these, only a small percentage show kernicterus post mortem.

The same two authors in 1935 reported on a child with a stormy icteric course at birth who subsequently lived to the age of 3, showing during life signs of diffuse involvement of the central nervous system associated with athetotic movements of the extremities. Microscopic examination of the brain at autopsy showed changes strikingly similar to those of kernicterus, though nuclear staining had not been seen in the gross examination. They again put forward the concept of the clinical diagnosis of kernicterus. De Lange in 1935 showed the lack of relationship between the degree of kernicterus and the amount of damage seen on microscopic section. Levine and Stetson in 1937 implicated an iso-immunization factor in the pathogenesis of erythroblastosis, later proved to be the Rh factor by Landsteiner and Weiner; and with this development began what might be called the modern concept of the disease and its present day therapy. Sobel and Zucker in 1940 reported on a case in which a patient at 3 and 1/2 years with neuromuscular defects, who had previously had erythroblastosis, died and did not show the usual changes of kernicterus at autopsy, but showed diffuse changes of a moderate degree scattered throughout the cerebral hemispheres and diencephalon. Leonard in 1945 reviewed 55 cases of erythroblastosis at New York Hospital for the years from 1938 to 1944. Nineteen of the patients died in the neonatal period, 5 of them showing kernicterus at autopsy. Of the surviving 36, 1 shows spasticity and mental retardation attributed to kernicterus. On the other hand, Docter in 1945 reported that of 13 patients with erythroblastosis who survived the neonatal period, 5 (38 per cent) showed manifestations of kernicterus, and 6 of the 7 who died showed this such involvement at autopsy.

Concerning the pathogenesis of kernicterus, recently there has been postulated what might be considered a modern version of one of the possibilities suggested by Bencke in 1907. In a recent article, Weiner has suggested that the agglutinated red cells plug the capillaries of the brain, resulting in anoxemia. The ganglion cells, being most susceptible to short periods of anoxia, die and are then stained by the bile in circulation. This leaves a flexible enough concept to explain the occurrence of degeneration in other portions of the brain, making it a circumstance dependent on the location of the emboli.

The paper by Docter and the case of a living kernicteric child prompted the author to undertake a like survey of all proved cases of erythroblastosis fetalis in the records of Children's Hospital, Washington, D. C., with a view to ascertaining the number of living kernicteric children in this group. The

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criteria for inclusion in this series was the typical pattern of an Rh-positive child born of an Rh-negative mother and presenting either neonatal jaundice or anemia.

Of 35 patients with erythroblastosis for whom follow-up records were obtainable, 6 have died and 29 are still living. The ratio of white to Negro in this series was 31 to 4.

Analysis of the autopsy reports on the 6 who died failed to show any correlation between the severity and extent of clinical manifestations of involvement of the central nervous system and the findings on pathologic examination.

Of the 29 living children 4 (15 per cent) show signs of involvement of the central nervous system that may be interpreted as caused by kernicterus. Two of these 4 showed evidence of involvement of the central nervous system in the neonatal period. None of the remaining 25 normal children showed any such neonatal involvement.

Transfusion therapy should be directed against the anemia and is of no value in ameliorating the damage to the brain that has already occurred. (Am. J. Dis. Child., June '47 - R. Stiller)

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(Not Restricted)

Lead Poisoning from Work at Shooting Galleries: Four cases of lead poisoning, none of them fatal, developed among attendants at shooting galleries in Baltimore.

The first had come to the attention of the City Health Department in 1942, when a physician submitted a specimen of the patient's blood for laboratory analysis. This patient was hospitalized and the record indicated a two-year span of work in a shooting gallery and a diagnosis of chronic lead poisoning. Another attendant at a shooting gallery was found to have lead poisoning when a specimen of his blood was submitted to the City Health Department laboratories for analysis on 18 March 1946. Following this diagnosis, air tests were made at the shooting gallery where the patient had been working, and it was determined that significant amounts of respirable lead dust are released into the air upon the impact of lead bullets against a steel target. Two more persons working at a different shooting gallery were found to have lead poisoning in April, 1946. One was very ill and remained in a hospital for more than two weeks. This man had just been assigned additional "clean-up" duties at the shooting gallery after the discovery of the first case there, and the severity and acute nature of his illness probably resulted from these exceptional exposures to lead dust. Environmental studies of this and 13 other indoor shooting galleries in Baltimore revealed that the atmospheric concentrations of lead dust exceed many times the permissible safe limit. The extent of the air pollution was substantiated upon examination of settled dust on horizontal ledges near the firing positions in a number of galleries. It was found that the major

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portion of the dust usually was composed of small metallic lead particles. Since the occurrence of poisoning by metallic lead is very uncommon, the composition of the dust was determined chemically and the results confirmed by an x-ray diffraction examination made by Professor J. D. H. Donney, of the Department of Geology of the Johns Hopkins University. Pursuing the investigation further, the Division of Industrial Hygiene, with the assistance of the Division of Chemistry of the Baltimore City Health Department, fired experimentally 11 types of .22 and .38 caliber bullets supplied by leading small-arms ammunition manufacturers. All air tests made at the firing position showed excessive dust concentrations with the target located at a distance of 35 feet. Other data indicated that there was no apparent correlation between the amount of dust produced and the muzzle velocities, weights of the projectiles or composition of the bullets, and that the rise in temperature upon the impact of the bullet with the target was insufficient to volatilize the lead. Later an unusual opportunity arose to study clinically and environmentally the effects of exposures of two weeks' duration when a large law-enforcing agency held its first target practice in four years. Pistols firing .35 caliber ammunition were used in eight galleries each attended by a range master. At the conclusion of the practice period, blood specimens were obtained from the attendants and analyzed for lead. Although the blood of unexposed persons may contain about 0.03 mg. of lead per 100 Gm. of blood, the results of the eight specimens showed blood lead content that ranged from 0.040 to 0.082 mg. Air tests were made in three of the galleries during actual practice and the results showed that the lead dust was from seven to 66 times the maximum allowable concentration (0.15 mg. per cubic meter of air) under the state and city regulations adopted pursuant to the authority of the state occupational disease control law. Having established the nature of the exposure to lead dust in shooting galleries, the final phase of the investigation was devoted to developing a method for controlling the hazard. Exhaust ventilation principles based upon conventional designs were impractical because of the large volume of air required for the removal of the dust. A modified "push-pull" system was employed with an air curtain maintained at the firing line, while an exhaust fan operated behind the target. Following this installation, dust samples collected from the air disclosed that the concentration was well below the maximum allowable limit even when rapid firing was taking place.

The technical features of the newly designed protective system, together with accompanying engineering data, may be secured from the Division of Industrial Hygiene of the Baltimore City Health Department. (Indust. Med., Aug. '47

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(Not Restricted)

Cheese and Its Relation to Disease: As a standard item of diet, cheese rates high from a nutritive standpoint. It is therefore important that it should be surrounded with all the necessary sanitary safeguards to insure a product free of disease germs. Cheese like other dairy products, such as ice cream and butter, does not receive the attention from the standpoint of public health that it merits. However, the long list of epidemics of disease traced to it

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within recent years has awakened interest in the need for sanitary regulations governing its manufacture and sale.

During the past 50 years or so there have been no less than 59 recorded outbreaks of disease due to cheese with 2,904 cases and 117 deaths, in the United States and Canada. Since 1912 when it was first demonstrated that better cheese could be made from pasteurized milk than from raw milk, there have been at least 50 epidemics with 2,715 cases and 117 deaths. There is every reason to believe that this represents only a part of the disease caused by cheese.

The organisms most commonly associated with cheese-borne infections are members of the Salmonella group such as Salmonella aertrycke, schott-muelleri, suipestifer, typhimurium, and choleraesuis; Eberthella typhosa; Staphylococci, such as Staphylococcus albus, and aureus; of the Brucella group, Brucella melitensis but not abortus; and Clostridium botulinum. There are no reports in the literature of undulent fever due to Brucella abortus although cheese doubtless is made from milk containing an abundance of these bacteria. Likewise, there are no reports in the literature of septic sore throat or scarlet fever due to streptococci despite the fact that these organisms must be present at times in raw milk made into cheese. In general, Escherichia coli is not considered as a cause of poisoning from cheese.

Two things stand out when a study is made of the various epidemics caused by cheese. One is that the cheese generally has been made from raw milk and that it has been sold and eaten too quickly after it has been made. Likewise, in the experiments testing the longevity of pathogens in cheese the data show that pathogenic bacteria die out more quickly at high than at low temperatures. This leads to the obvious conclusion that all milk and cream used in the manufacture of cheese should be pasteurized and aged at a high temperature. If this were done, the transmission of disease by eating cheese would disappear.

Pioneer work for using pasteurized milk for cheese making was done in 1912 by Sammis and Bruhn in Wisconsin. Contrary to the opinion of many cheese makers, pasteurized milk makes a consistently higher scoring and better flavored Cheddar cheese than cheese made from raw milk. Cheese made from pasteurized milk can be ripened in about half the time required to ripen cheese made from raw milk, since it can be held at a higher temperature. Experiments made by seeding pathogens into milk and making the milk into cheese show that the pathogens die out more rapidly at the higher temperatures.

To date there is no record of an epidemic traced to Swiss cheese although so far it has been impossible to make a Swiss cheese from pasteurized milk. It is interesting to note that it is necessary to heat the milk to a higher temperature in the making of Swiss cheese than in Cheddar cheese. However, the milk still gives a phosphatase test.

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There are only seven states in the United States that now require cheese to be made from pasteurized milk or cream or to be held in storage for periods ranging from 60 to 120 days in lieu of pasteurization. The 60-day holding period is considered too short a time for the Cheddar-type hard cheese since pathogens and/or their toxins may survive this storage period, especially if the cheese is held at low temperatures, from 40° to 50° F. A 90-day holding period is considered preferable, and 120 days still better. Pasteurization of all milk used in making soft cheeses should be required because many soft cheeses cannot be held for 60 days without spoilage or deterioration in quality. (Am. J. Pub. Health, Aug. '47 - F. W. Fabian)

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Reports on USN Research Projects:

(Not Restricted)

A Colorimetric Method for the Determination of Iodine Numbers. Although there are many available technics for the determination of iodine absorption values of fats, the method proposed by Wijs and accepted by the International Union of Pure and Applied Chemistry at Hague in 1929 is still the method of choice of most investigators. It may be assumed that this and related procedures measure only the average unsaturation of the substances. In this study it was found that the optical density of solutions of Wijs' reagent in chloroform is proportional to the concentration of titratable iodine at a wave length of 400 mμ. When known amounts of fat are added to this reagent, the change in optical density is proportional to the degree of halogenation. Therefore, iodine numbers may be determined colorimetrically in a simple and rapid procedure. A good aspect of this method is that it enables one to follow the rate of disappearance of free iodine from a solution. Thus, the rate of halogenation of a substance may be studied with only one specimen instead of titrations of many samples. Conjugation of double bonds, iso-isomerization and possibly polymerization may be studied easily by following this reaction. (NM 007 030, Rep. No. 2, 7 Jul '47, Nav. Med. Res. Inst., Bethesda, Md. - R. H. Weaver and G. Fish)

NOTE: Those interested in seeing copies of the complete reports should address their request to the research activity from which the report originates. Opinions or conclusions contained in these reports are those of the authors. They are not to be construed as necessarily reflecting the views or the endorsement of the Navy Department. Reference may be made to those reports marked "Not Restricted" in the same way as to published articles, noting authors, title, source, date, project number, and report number. No part of the content of RESTRICTED reports may be published, reproduced, or referred to in articles for publication without permission obtained through the Bureau of Medicine and Surgery.

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Dental Examinations: Frequent inquiries are received in the Bureau of Medicine and Surgery from government officials, parents of candidates and other interested persons, regarding applicants who have failed to meet the dental standards for entry into the Navy. This is especially true of candidates for the U. S. Naval Academy and the NROTC-NACP program. It is the Bureau's experience in these cases that the Report of Physical Examination often does not contain sufficient information upon which to base an intelligent reply. Therefore, whenever a candidate is found not to meet the dental standards for entry into the Navy, a detailed description of the disqualifying dental defects should be entered on the Report of Physical Examination. For instance, when a candidate is rejected for malocclusion, it is not sufficient merely to write "yes" after the entry "marked malocclusion," but additional information should be included, such as, for example, the following: Angle's Class III, 6 mm. overjet, 11 mm. overbite, impingement of mandibular incisors on soft tissue of palate. (Dental Div., BuMed)

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(Not Restricted)

Recording the Results of Eye Refractions and Prescriptions for Spectacles: It has been noted in the Bureau of Medicine and Surgery that in many cases proper entries in the Health Record have not been made of (1) the results of eye refractions, and (2) the prescriptions that have been issued for spectacles. In this connection the attention of all concerned is called to that part of paragraph 2237.1 of the Manual of the Medical Department, USN, which specifies that certain entries shall be made on NAVMED H-3a and NAVMED H-8 of the Health Record. (PQ and MR Div., BuMed)

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(Not Restricted)

Training in Radiological Safety: The Bureau of Medicine and Surgery announces the availability of a six weeks' course in Radiological Safety at Edgewood Arsenal, Edgewood, Maryland, beginning 22 September 1947, and every six weeks thereafter. The course at the Edgewood Arsenal is intended for officers stationed on the East Coast and is similar to the course in Radiological Safety given at Treasure Island, Calif. The course deals with the protection of personnel from excessive exposure to radiation, a study of the effects of an atomic explosion, and decontamination procedures.

No service agreement is necessary and Reserve medical officers are eligible to apply providing they have 15 months of obligated service after completion of the course. Medical officers of the regular Navy who desire to specialize in this field will be given preference. (Professional Div., BuMed)

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(Not Restricted)

Improper Accomplishment of Dental NavMed Forms and Other Reports:

The Bureau of Medicine and Surgery is receiving in steadily increasing numbers dental NAVMED forms and other reports required from dental activities which are improperly, incorrectly, or carelessly accomplished. It is evident that responsible dental officers are not checking these forms and other reports before they affix their signatures. This is becoming a matter for grave concern because the staff in the Bureau of Medicine and Surgery which compiles the data from the forms or reports and computes the statistics cannot correct the tremendous number of errors and discrepancies, most of which are manifestly due to carelessness or indifference.

In the future District and Staff Dental Officers are to use a check-off list to account for all copies of dental NAVMED forms and other reports, when due from the dental activities under their cognizance, and carefully review them for the following:

a. Prompt submission.
b. Latest revised form.
c. Date.
d. Compliance with instructions for accomplishment.
e. Omissions.
f. Completeness.
g. Errors or discrepancies.
h. Evidence of carelessness or indifference.

It is the duty of District and Staff Dental Officers to inform the responsible dental officers when dental NAVMED forms and other reports are not being properly accomplished, and to institute the necessary action for prompt revision and resubmission to the Bureau of Medicine and Surgery.

In the future all dental NAVMED forms and reports received in the Bureau of Medicine and Surgery which have not been properly accomplished will be returned immediately to the originators with a request that they be revised and resubmitted without delay.

The following are a few examples of discrepancies and errors commonly occurring:

NAVMED-K (Rev. 5-47):

a. Incorrect addition of figures, especially "TOTAL EXAMINATIONS AND DIAGNOSES" under the heading "EXAMINATIONS AND DIAGNOSES."

b. Failure to enter figures for totals where required.

c. Incorrect entries or omissions under the heading "CASE STATISTICS" for comparable entries under the heading "MISCELLANEOUS TREATMENTS" and vice versa.

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d. Writing in of treatments, procedures, or cases under "OTHER" for which lines are provided, for example: "Torus maxillaris removal," for which the line "TORUS PALATINUS, REMOVAL OF" is provided.

e. Failure to carry forward the figures under "CAL. YEAR TO DATE" from the former NAVMED-K (Rev. 1-45) to the new NAVMED-K (Rev. 5-47).

f. Carrying the figures forward under "CAL. YEAR TO DATE" on the basis of a fiscal year.

g. Making entries under "REMARKS" for which lines are provided, for example: "Three dental officers on 32 days leave," instead of an entry "32" on the line "TOTAL DAYS DENTAL OFFICERS ON LEAVE."

h. Incorrect computations and entries for (A), (B), (C), and (D), and incorrect addition and entry for "TOTAL PATIENTS TREATED," under "TREATMENT SUMMARY."

i. Separate NAVMED-K not submitted for categories enumerated in paragraph 2, under "Instructions" printed on form.

NAVMED-L (Revised 1945):

a. Failure to make all entries required, especially the file or service number, and the shade, mold, and number of teeth.

b. Indistinct copies.

NAVMED-461 (Rev. 4-47):

a. Failure to interpret correctly the reasons for entries.

b. Failure to make required entries in detail.

NAVMED-610 (Rev. 8-46):

a. Use of obsolete form with incorrect stock numbers.

b. Incorrect entries for values.

c. Incorrect computation, addition, and totals.

d. Failure to balance with entries for dental prosthetic items in NAVMED-K and with NAVMED-L.

NAVMED-785 (Rev. 4-47):

a. Use of obsolete form.

b. Failure to comply with instructions printed on form.

(Dental Div., BuMed)

Circular Letter 47-109 19 August 1947 (Not Restricted)

To: All Ships and Stations

Subj: BuMed Material Requisition NavMed 4 - Preparation and Submission of,

Ref: (a) BuMed Circular Letter No. 47-33 of 17 March 1947; ND Bul of 31 March 1947, 47-313.

1. In order to prevent duplication of Medical Supply Depot Requisition numbers by Medical and Dental Departments in the field, paragraph 9(b) of reference (a) is modified to read as follows:

> Requisition No. - Except where inclusion in Command series is required, requisitions shall be numbered consecutively in a separate series for each fiscal year. The Medical Department shall use the odd numbers of the series, i.e., SD 1-48, SD 3-48, SD 5-48. The Dental Department shall use the even numbers of the series, i.e., SD 2-48, SD-4-48, SD 6-48. Where inclusion in Command series is required, requisitions shall be numbered in accordance with Area Commander's directives.

2. Reference (a) is further modified as follows:

a. Add the following new reference:

"(e) - BuMed Circular Letter 45-23 dated 23 January 1945".

b. Change paragraph 9(p) of reference (a) to read as follows:

"Medical Department shore activities enter maximum stock figures established in accordance with instructions contained in reference (e). Naval vessels enter maximum stock figures established in accordance with instructions contained in Part VI, Paragraph 3069, Manual, Medical Department".

--BuMed. C. A. Swanson

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Circular Letter 47-110 19 August 1947 (Not Restricted)

To: Comdts, All NDs (less 10, 14, 15, and 17).
Attn: District Medical Officers

Subj: Trailer, Four Wheel, Mobile, Surgical Operating; Assignment to Naval Districts for Disaster Relief.

(Not Restricted)

Encl: 1. (HW) Basic Allowance List for Trailer, Four Wheel, Surgical Operating.

1. The recent Texas City Disaster demonstrated the desirability of providing a mobile type surgical unit to augment other emergency supplies and equipment available to Commandants of Naval Districts in furtherance of District Casualty Plans. Such a unit was procured, equipped, and used, jointly by the Marine Corps and the Bureau of Medicine and Surgery during World War II. These units provided a highly mobile, self sustaining operating unit for the Medical Departments of Marine Divisions.

2. Enclosure (1) outlines the basic allowance of supplies and equipment provided by this bureau for these trailers.

3. The Commandant, U.S. Marine Corps has agreed to the assignment of eleven (11) of these trailers to Naval Districts for use in disaster relief, subject to return to the Marine Corps, in condition for immediate use, when required. Assignment of these vehicles by the Marine Corps to the Bureau of Medicine and Surgery will be on a custody basis, with the Marine Corps retaining accountability records. Custody will be further assigned by this bureau to the District Medical Officer having cognizance; maintenance and upkeep will be provided by the hospital designated by the District Medical Officer. Funds required for maintenance, upkeep and operation will be chargeable to the hospital so designated, however, the vehicle will not be taken up in the property records of the hospital.

4. Addressees shall immediately advise this bureau, referencing this letter, of the hospital to which they desire one of these units assigned.

5. Periodic inspections of this trailer and its components shall be made in order to insure maximal efficiency at all times and when required for immediate use. The medical component shall be maintained in accordance with the basic allowance list; Enclosure (1), plus such other consumable supplies as required by the surgical team for the operation of this unit. Attention shall be given to the rotation of items subject to deterioration. Requisitions shall be submitted as required to bring the medical component of these trailers up to approved allowance. Inspection, maintenance and upkeep shall include qualified personnel to inspect and service the non-medical components of the trailer, such as air conditioning unit, generator and lighting system. No change is to be made in exterior color and USMC markings of trailer. Should repainting become necessary, basic color and markings will be adhered to. A suitable towing vehicle shall be assigned from automotive equipment available to the hospital or within the district.

6. Addressees shall augment the above instructions as necessary, including instructions for the training of surgical teams from personnel available to the

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hospital in order that this unit may be readily available for disaster relief when required.

--BuMed. C. A. Swanson

ENCLOSURE 1

Item	Stock No.	Description	Unit	Amount
1.	9-593-125	Unit #23 - Surgical Utensil Set	One	1
2.	9-590-225	Unit #24 - Surgical Linen and Supply Kit	One	1
3.	9-563-225	Unit #25 - Surgical Dressing Kit	One	1
4.	9-526-375	Unit #36 - Surgical Instrument Kit	One	1
5.	3-752-500	Suction Apparatus, Automatic, Thermotic, Portable, 110 Volt, AC-DC	One	1
6.	3-425-600	Inhalator, Mask Type, Oxygen-Helium Outfits	One	1
7.	3-425-240	Bag, Rebreathing, 2 liter	One	1
8.	3-425-350	Mask, Oronasal, Rubber	One	1
9.	7-099-035	Table Operating, Pedestal, Medium	One	1
10.	4-463-120	Tubing, Rubber, Red 1/4 d. 1/8 Well	Each	5

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Circular Letter 47-111 27 August 1947 (Not Restricted)

To: All Ships and Stations

Subj: Secret and Confidential Reports, Downgrading of

Ref: (a) Article 76(5)(b), Navy Regulations, 1920

1. The following secret and confidential reports are hereby downgraded as indicated:

Report	Present Classification	Downgraded to
"United States Naval Medical Service in the Invasion of Normandy," by Captain G. B. Dowling (MC) USN.	Secret	Restricted
Reports of Survivors from Sunken Aircraft and Vessels.	Secret and Confidential	Unclassified

--BuMed. C. A. Swanson

Circular Letter 47-112 27 August 1947 (Not Restricted)

To: All Activities having a Representative of the Medical Department on Board.

Subj: Reports Control Program, Bureau of Medicine and Surgery

Ref: (a) SecNav ltr to all ships and stations dtd 20 March 1947, (Navy Department Bulletin of 31 March 1947, Item No. 47-282.)

1. A Reports Control Program was established in the Bureau of Medicine and Surgery on 21 January 1947. The purposes of this program, as subsequently established within the naval establishment, are outlined in reference (a). As the first step in the program, a review was made of periodic reports prepared by field activities. Information to accomplish the first step was requested from selected field activities. The inventory and analyses of required periodic reports are currently in progress.

2. In order to implement the program more fully, additional information is being requested from selected field activities concerning situation reports. A situation report is one prepared upon the occurrence of an event or situation of certain prescribed characteristics (such as death, accident, explosion, etc.) To insure the success of the program each field activity is requested to submit comments on any report which it is believed can be eliminated, consolidated, simplified, improved, or submitted less frequently or at a time more advantageous to operations.

3. To minimize the workload at the field level, only the activities listed below are requested to assemble and submit the following material to the Bureau by 22 September 1947:

U. S. Naval Hospital, Oakland, California
U. S. Naval Hospital, Newport, Rhode Island
U. S. Naval Hospital, Corpus Christi, Texas
U. S. Naval Hospital, Quantico, Virginia

Material to be submitted covering SITUATION Reports prepared:

(a) A list of situation reports submitted to the Bureau, showing form number if any, title of report, reference to the requiring directive, and distribution of copies. Attach a specimen copy of each report or report form listed.

(b) Supplement lists, in duplicate, of situation reports which are submitted to other bureaus and offices of the Navy Department, to Naval Districts or other Naval field activities, and to agencies or offices outside Navy. Prepare a separate list for each organization to which reports

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are submitted, showing form number if any, title of report, reference to requiring directive, and distribution of copies. Attach a specimen copy of each report or report form listed if available.

(c) Specific comments containing concrete suggestions for improvements on any or all reports appearing on the completed lists.

--BuMed. H. L. Pugh

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Circular Letter 47-113 27 August 1947 (Not Restricted)

To: All Ships and Stations

Subj: Routine Roentgenographic and Photofluorographic Examinations of the Chest of all Navy and Marine Corps Personnel for the Year 1 Oct 1946 - 30 Sep 1947, Request for Information.

Ref: (a) Para. 21103, MMD.

1. In order to obtain a sample of the number of Navy and Marine Corps personnel who have received routine roentgenographic or photofluorographic examination of the chest in accordance with ref (a) during the period 1 October 1946 to 30 September 1947, it is requested that addressees report the following data to the Bureau of Medicine and Surgery, as soon as practicable, in the following form:

(a) (Name of Ship or Station)_____. (Date)_____.

(b) (Address)_____.

(c) Total number of Navy and Marine Corps personnel on board as of 1 October 1947---------- _____.

(d) Total number of such personnel whose last name begins with the letter "C" ----------_____.

(e) The total number of such personnel whose last name begins with the letter "C" whose Health Record contains a report of a routine roentgenographic or photofluorographic examination of the chest during the period 1 Oct 1946 to 30 Sep 1947----------

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(f) The total number of such personnel whose last name begins with the letter "T" ---------- _____.

(g) The total number of such personnel whose last name begins with the letter "T" whose Health Record contains a report of a routine roentgenographic or photofluorographic examination of the chest during the period 1 Oct 1946 to 30 Sep 1947 ---------- _____.

2. Activities outside the continental limits of the United States and west of the Mississippi shall submit this information via air mail.

--BuMed. C. A. Swanson

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Circular Letter 47-114 28 August 1947 (Not Restricted)

To: All Ships and Stations

Subj: Procurement of Medical and Dental Books, Policy Regarding

Ref: (a) BuMed Circular Letter 47-33

1. The following policy relative to requisitioning of professional books is effective immediately. Adoption of this policy is necessary to prevent the wasteful condition occasioned by routine stocking of large numbers of books by Medical Supply Facilities. Professional books have a foreseeable obsolescence due to frequent publication of new editions. Accordingly, a rigid fixation of requirements planning is mandatory and will be implemented as follows:

2. Henceforth, each medical and dental activity will submit requirements for standard (catalog listed) professional books directly to Materiel Division, Bureau of Medicine and Surgery, 84 Sands Street, Brooklyn 1, New York, by requisition, NavMed Form 4, during August and February of each fiscal year to reach the Materiel Division by 1 September and 1 March. (The date 1 September is extended to 1 October for fiscal year 1948.) At the same intervals and in accordance with paragraph 10 of reference (a), separate requisitions shall be submitted by each medical and dental activity for such nonstandard professional books (not listed in the catalog) as may be required. Justification for each nonstandard item must be forwarded.

3. Total Navy semiannual requirements for medical and dental books, both listed and nonstandard, will be determined after all requisitions from the field have been submitted to the Materiel Division and procurement then initiated. Delivery to the requisitioning activities will be accomplished as soon as the books become available from the publisher.

--BuMed. H. L. Pugh

Circular Letter 47-115 29 August 1947 (Not Restricted)

To: All Ships and Stations

Subj: Radium Plaque Adaptometer Night Vision Testing of Naval Personnel, Post-War Program for.

Refs: (a) CNO ltr OP-414 Serial 1162P414 dtd 15 Apr 1947.
(b) VCNO ltr Op-23-1-BN(SC) P2-3 Serial 0287923 dtd 14 July 1943.
(c) BuPers-BuMed Joint ltr (NDB 44-404) dtd 22 Mar 1944.
(d) BuMed ltr (NDB 45-1317) dtd 14 Sep 1945.
(e) BuPers ltr (NDB 43-1638) dtd 18 Nov 1943.

1. References (c), (d), (e), and all other directives pertaining to the promulgation and implementation of subject program in conflict herewith are hereby cancelled and superseded by this letter.

2. Effective as soon as practicable following receipt of this directive all Naval personnel, including both officer and enlisted, newly entering the service, will be tested for night vision by the Radium Plaque Adaptometer. Personnel who fail shall be retested.

3. Testing units, including the necessary personnel for operation, and the purchase and distribution of the necessary equipment, are hereby authorized and will be continued in operation or established on the following stations:

Naval and Marine Corps Training Centers
Hospital Corps School (Intermediate) Portsmouth, Virginia
Naval Academy
Naval Hospitals.

Testing units shall be under the cognizance of Medical Department personnel. Radium Plaque Adaptometer instruments will be made available and distributed by the Materiel Division of the Bureau of Medicine and Surgery. Instructions for operation and maintenance of Radium Plaque Adaptometers are being prepared and activities listed above will be informed when such instructions are ready for issue.

4. Hospital Corps personnel will be utilized and trained as RPA operators at the Hospital Corps School (Intermediate), Portsmouth, Virginia. Qualified operators will be assigned duty on stations listed in Paragraph 3 above.

5. All testing will be conducted under the direction of a Medical Officer by qualified RPA Operators.

6. An entry will be made in the health records and service records of all personnel tested indicating "Pass" or "Fail."

--BuMed. C. A. Swanson --BuPers. T. L. Sprague

Circular Letter 47-116 29 August 1947 (Not Restricted)

To: All Ships and Stations

Subj: Defective Medical and Dental Material, Reporting of

1. A standard policy for reporting of defective medical and dental material which is considered unsuitable or dangerous for use is hereby promulgated

2 When any stock item is suspected of being injurious, defective, deteriorated, or otherwise unfit for use because of inherent characteristics, improper manufacture, or faulty or inadequate specifications, the activity holding such material, except Navy Medical Supply Depots and Storehouses, shall submit a report by letter to Materiel Division, Bureau of Medicine and Surgery, 84 Sands Street, Brooklyn 1, New York, giving the following information:

(a) Item stock number and title.

(b) Amount of stock apparently involved.

(c) Lot number, when applicable.

(d) Control number, when applicable.

(e) Manufacturer's and/or contractor's name.

(f) Date of receipt and source of supply.

(g) Statement as to the condition of other brands of the same item, if applicable.

(h) If the item is a drug or biological which has caused an untoward reaction upon administration, a description of the reaction shall also be included.

(i) Conditions under which item has been stored locally which may have adversely affected it.

3. A sample or samples, as appropriate, of the defective material shall accompany the report to MatDiv, BuMed, Brooklyn. If the item is a drug which is suspected of producing an untoward reaction, the offending unit, bottle, package, or box, should be included in the shipment and so identified.

4. Upon receipt of such information together with samples of the defective material, MatDiv, BuMed, will take necessary steps to have laboratory examinations performed by the Engineering Development Division of the Army-Navy Medical Procurement Office.

(Not Restricted)

5. Following receipt of the results of the laboratory examinations of samples submitted, the holding activity will be advised as to the disposition to be made of the material.

--BuMed. H. L. Pugh

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Circular Letter 47-117 2 September 1947 (Not Restricted)

To: MedOfCom, All Naval Hospitals

Subj: Armed Forces Radio Service in U. S. Naval Hospitals

Ref: (a) BuPers CirLtr 356-45, Navy Dept. Bulletin, July-Dec 1945, Item 45-1877.

1. The Bureau of Medicine and Surgery has received a request for information concerning the feasibility of all naval hospitals participating in the Armed Forces Radio Service program defined by ref (a).

2. To utilize the transcriptions provided by the Armed Forces Radio Service, certain radio equipment is required. The type equipment most suitable to the several purposes is well described in one paragraph of an Armed Forces Radio Service letter quoted below for information.

"(a) Radio broadcasting systems in service hospitals throughout the country vary in size from one channel systems to the new four (4) channel systems now installed and operated in the Army General Hospitals. In most cases, installations with one channel systems provide wall speakers in the wards for the patient listener. In the radio control room a turntable capable of playing transcriptions at either 78 or 33-1/3 RPM and one radio tuner is provided so that patients may hear either commercial radio broadcasts or the transcriptions especially prepared by the Armed Forces Radio Service for servicemen. The number of channels, of course, limits the selectivity of programs available at one time. Two (2) and three (3) channel setups usually have individual earphones for the bed patients, in addition to the wall speakers. In an effort to provide as much selectivity and diversification in programs for patients as possible, the new four (4) channel systems have incorporated the features of the smaller systems in addition to dual turntables, remote broadcasts facilities, and other innovations. Individual bed pillow speakers have been provided so that each patient may listen to any one of four (4) programs at one time without disturbing the patient next to him. Three (3) channels are used for the major network shows and the fourth channel is programmed locally by the personnel in the hospital radio station. These programs feature the Armed Forces Radio Service Troop Information and entertainment shows, as well as 'live' shows utilizing patient participation."

(Not Restricted)

3. In order that this Bureau may make a comprehensive reply to the Armed Forces Radio Service, the following information is desired from each U. S. Naval Hospital:

a. Is the hospital equipped to utilize the Armed Forces Radio Service programming material?

b. Does present equipment include a one-channel, two-channel, three-channel, or four-channel system?

c. Does the present equipment include ward speakers? Individual bedside earphones? Individual bed pillow speakers?

d. Does present equipment include a turntable (record player) in the control room?

e. Is the central control station equipped with a microphone for making announcements?

f. Is the location, space, and sound control for the control station, or adjacent space, adaptable to providing local talent skit programs, etc.?

g. If suitable equipment for the use of Armed Forces Radio Service is not available, is such installation considered desirable?

h. Are adequate personnel available to provide control station operation for this program?

i. If the reply to (g) above is affirmative, are funds for such installation available in the local Recreation Fund? (It is estimated that the installation of a three-channel system for an average 500 bed hospital will roughly approximate from $10,000 to $12,000).

j. In your opinion, does the average patient reaction to transcribed, recorded program material warrant the installation of equipment and/or utilization of Armed Forces Radio Service programming material?

--BuMed. H. L. Pugh

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Circular Letter 47-118 2 September 1947 (Not Restricted)

To: U. S. Naval Hospitals; U. S. Naval Medical Supply Depots; National Naval Medical Center, Bethesda, Maryland; U. S. Naval Medical Center, Guam, M. I.

Subj: Work Improvement Program in Medical Department Activities, Installation of,

(Not Restricted)

Ref: (a) NCPI 230.

1. The Bureau has been aware for some time of serious deficiencies in the industrial relations programs of its field activities. It is believed that improvement in this area can be accomplished best through the installation of effective training programs. The purpose of this letter, therefore, is to implement a decision reached by the Bureau and the Office of Industrial Relations to install the Navy's Work Improvement Program in Medical Department Activities.

2. Heretofore BuMed activities have been exempted from participation in the Work Improvement Program. By agreement between the Chief, BuMed and the Chief, OIR, this exemption has been withdrawn, thus making BuMed's participation in the Work Improvement Program mandatory.

3. Under the provisions of reference (a), all activities employing over 300 civilians are required to conduct a training program under the direction of a competent training supervisor. The guide provided on page 7 of reference (a) will be used in determining the size and type of training staff required.

4. Medical Department activities employing over 300 civilians shall take steps immediately to establish and fill a position as training supervisor. The position may be filled by either a civilian employee or an officer of the Hospital Corps who meets the qualification requirements set forth in reference (a). Consideration should be given to combining the duties of this position with those of an over-all industrial relations officer having full responsibility for the administration of the entire civilian personnel program of the activity. In activities employing less than 300 civilians, the MedOfCom shall take the necessary action to secure participation in the Work Improvement Program of some other naval activity in the geographic area.

5. Any additional civilian employment required as a result of this letter shall be absorbed within currently authorized Public Law 390 Ceiling and funds for personal services.

6. Addressees should confer with the District Civilian Personnel Directors on the staff of the Commandant of the Naval District in which the activity is located in order to obtain assistance in implementing the provisions of this letter.

--BuMed. C. A. Swanson

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Circular Letter 47-119 19 August 1947 (Not Restricted)

To: All Naval Hospitals

Subj: Refund of Lump-Sum Leave Payment by Civilian Employees.

Ref: (a) NCPI 105.12-6d (Rev. I, Amend. 2).

This letter from the Acting Chief of BuMed (1) points out that in accordance with reference (a), it is the responsibility of naval activities to ascertain if new appointees are entering on duty prior to the expiration of leave represented by lump-sum payment from another activity or Government agency and (2) gives instructions concerning the management and financial accounting in cases involving refunds.

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ALNAV 184 26 August 1947 (Not Restricted)

Subj: Medical Officer and Dental Officer Procurement Act

1. Public Law No. 365 - Eightieth Congress approved 5 August 1947 amends the Pay Readjustment Act of 1942 to provide additional compensation at the rate of one hundred dollars per month for each month of active service performed by commissioned officers of the Medical and Dental Corps of the U. S. Navy and for commissioned members of the Reserve components thereof who may during the five-year period immediately following the effective date of this Act volunteer and be accepted for extended active duty of one year or longer. This part of the law will become effective on the first day of September 1947, and the payments provided thereby shall not accrue for any prior period. A further proviso of the law limits the amount paid to any one officer under this authority to a total of thirty-six thousand dollars computed on the basis of twelve hundred dollars yearly for a period of thirty years' active service.

2. It is to be particularly noted that Reserve medical and dental officers performing obligated service in accordance provisions Alnav 281-46 are specifically excluded from the benefits of this law by virtue of their involuntary status. Personnel in this category may establish eligibility for added compensation by appointment to permanent commissioned status in the regular Navy at any time during period of their obligated service. On completion of their obligated service they may establish eligibility as outlined in paragraph 1.

3. The Medical Department has serious need for the services of these Reserve medical and dental officers as members of the permanent naval establishment. All commands are accordingly enjoined to employ the inducement provisions of this legislation as basis for procurement of medical and dental officers and to advise all eligible members of staff of method of effecting transfer appointment in the Medical and Dental Corps of the regular Navy in accordance with procedures outlined in BuPers Circular Letter Number 288-45 (Revised).

(Not Restricted)

4. Candidates should be advised that equity acquired by the temporary ranks attained by active commissioned service in the U. S. Naval Reserve since 8 September 1939 will enter fully into establishment of precedence and lineal position in event of transfer appointment in Medical and Dental Corps of the regular Navy.

5. This Alnav does not repeat not constitute authority for disbursing officers to enter credit of pay of one hundred dollars. Separate disbursing instructions will follow. --SecNav.

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ALNAV 185 26 August 1947 (Not Restricted)

Subj: Army and Navy Catalog of Medical Materiel

Effective 1 October 1947 Army and Navy Catalog of Medical Materiel will supersede and render obsolete BuMed Section Catalog of Navy Material.

Automatic initial distribution of new catalog (Stock No. 10-900-500) will be made to regular and Reserve activities having medical or dental personnel attached. Activities which have not received catalog by 15 September 1947 shall inform U. S. Naval Medical Supply Depot, Sands and Pearl Streets, Brooklyn, and request shipment. Additional copies may be requisitioned from NMSD, Brooklyn, on NavMed Form 4.

Upon receipt of new catalog all Medical and Dental Department activities shall take immediate action to adopt revised prices and to adjust stock control and general ledgers as expeditiously as possible in accordance with procedures outlined in enclosure (A) of BuMed Circular Letters 46-79, 46-143, and 47-39. Accounting procedures outlined in enclosure (A) of BuMed Circular Letter 46-79 shall be effected as of 1 October by all activities except repeat except vessels of Reserve fleets. Reserve fleet vessels shall modify stock records and adjust ledgers, when placed in commission or at such time as Medical Department spaces are activated, using unit prices in effect at that time.

Medical stores on hand shall be re-marked concurrently with accomplishment of above outlined procedures.

Requisitions received by depots after 1 October listing old catalog numbers will be returned to requesting activity for correction. --SecNav.

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Op21D-jc
Serial 2988P21 31 July 1947 (Not Restricted)

From: Chief of Naval Operations.
To: All Ships and Stations.

Subject: Changes in U. S. Navy Regulations deemed necessary to effectuate the provisions of Public Law 284, 79th Congress, 1st Session - Advance changes.

1. The following changes in U. S. Navy Regulations, 1920 have been approved by the President and are promulgated in advance of printed change:

TABLE OF CONTENTS:

Page VI. Chapter 32 - Between "MEDICAL" and "OFFICERS" insert "AND DENTAL".
Sec. 1 - between "Duties" and "aboard" insert "of the Medical Officer".
Sec. 2 - change "1183" to "1181".

Page X. Chapter 54 - Following "Sec. 15" insert new line: "Sec. 15A. Reports from dental officers ..... 734".

INDEX:

Page 33. Under "Dental Corps" opposite "officer" change "1183" to "1181"; opposite "duties of" change "1179" to "1181"; delete "to report patient's condition to medical officer ..... 1180" and substitute "collaboration with medical officer .....1181"; opposite "property and stores" delete "1182, 1183" and substitute "1178"; following"records" insert on the same line ",adverse entries in" and change "1181" to "1179".

TEXT:

Page 36. Art. 118(1) - Between "medical" and "purposes" insert "or dental"; make the same change in line 5 of Art. 118(3).

Art. 121 - In line 2, change "medical department" to "medical and dental departments."

Page 53. Art. 148(3) - In line 2, substitute "Mister" for "Mr."; in line 3, insert "or Dental Corps" after "Medical Corps" and substitute "Doctor" for "Dr."; in line 8, delete "and" before "lieutenant"; in line 9, substitute a semicolon for the period after "Navy" and add "and Lieutenant John Doe, Dental Corps, United States Navy."

Page 61. Art. 170 - Add new sub-paragraph "(2)" as follows:

"(2) Officers of the Dental Corps shall command naval dental schools, naval dental technician schools, base and post dental detachments, and separate naval dental clinics." Change marginal note to read, "Command by officers of medical and dental corps."

(Not Restricted)

Page 153. Art. 457(1) - In line 4, between "injured,"and "for" insert "for the conduct of the dental service,".

Page 153. Art. 457(2) - In line 3, insert comma after "Medical School" and insert "Naval Dental School," between "School," and "and".

Page 153. Art. 458(1) - In line 8, between "the" and "care" insert "medical and dental". At top of page 154, in line 3, delete "and" between "medicine and surgery", insert comma before and after "surgery", and insert "and dentistry" between "surgery" and "as". At top of page 154, following line 4, add a new sentence, "Its Dental Division shall study, plan and direct all matters pertaining to dentistry."

Page 154. Art. 458(4) - In line 3, between "supplies" and "of", insert "and equipment". In line 6, between "School," and "and", insert "the Naval Dental School,".

Page 208[1]. Art. 665 - In line 6, between "medical" and "service" insert "or dental".

Page 210. Art. 685 - In line 1, between "medical" and "officers insert "and dental".

Page 246[3]. Art. 810 - In lines 3 and 4 and in marginal title, after the word "medical" insert "or dental",and "respectively" in the fourth line after the word "guard".

Page 341. At top of page change heading "THE MEDICAL OFFICER" to "MEDICAL AND DENTAL OFFICERS".

In sub-heading "Sec. 1.", change "Duties aboard ship." to "Duties of the Medical Officer aboard ship."

In sub-heading "Sec. 2.", change "1183" to "1181".

Change "Section 1. - Duties aboard ship." to "Section 1. - Duties of the Medical Officer aboard ship."

Page 341. Art. 1132 - In line 3, delete period after"Surgery" and insert "except those under the charge of the dental officer."

Page 350. Art. 1176(1) - In lines 1 and 2, delete "and dental"; in line 3, delete the comma after "Corps"; between "Corps" and "and" insert "except those assigned to the Dental Department,".

In Chapter 32, pages 350-351, under "Section 2. - Dental Officers." delete Articles 1178 to 1183, inclusive, and substitute:

"1178

Duties. The head of the dental department of a command or other activity shall be designated the 'dental officer'. He shall be responsible, under the commanding officer, for:

(Not Restricted)

(a) Making dental examinations and providing dental care and treatment to the personnel of the command and, when directed by the commanding officer, to such other persons in the armed forces of the United States as may be present and require such services.

(b) Preventing and controlling dental diseases, supervising dental hygiene within the command, and advising the commanding officer on all matters pertaining thereto.

(c) Furnishing such other dental services as are provided for by law.

Dental property. (d) Procuring, storing, issuing, transferring, and accounting for dental stores and equipment.

1179

Adverse entries in dental record. The dental officer shall inform the person concerned and permit him to see the record whenever an entry is made in such person's dental record of a serious operation, injury, or physical defect which may adversely affect, other than temporarily, his efficiency in the performance of duty. In case the dental officer considers it impracticable or inadvisable for the person concerned to see the entries in his dental record, the commanding officer shall be so advised and notation to that effect made in the record.

1180

Duties in Battle. The dental officer and his subordinates shall, in emergency situations and in other circumstances prescribed in the organization of the command for battle, perform such duties for the care of the sick and injured as the commanding officer may direct.

1181

Collaboration with the medical officer. The dental officer shall inform the medical officer of any disease or condition, discovered in the course of dental treatment or examination, which requires medical attention, and shall consult with the medical officer regarding all cases requiring collaboration in treatment."

Page 357. Art. 1200 - Change to read as follows:

"1200

Physical examinations of persons in the naval service and of candidates for enlistment or appointment therein shall be

(Not Restricted)

conducted only by officers of the Medical Corps, except that dental examinations shall be conducted by officers of the Dental Corps, if available."

Page 358. Art. 1202(1) - In line 2, between "medical" and "examiners" insert "and dental".

Page 362. Art. 1211(1) - In line 4, delete "medical supplies" and insert "medical and dental stores".

Page 362. Art. 1211(2) - In line 3, delete "medical supplies" and insert "medical and dental stores".

Page 376. Art. 1266(1) - In line 2, substitute "medical officer or the dental officer" for "senior medical officer".

Page 376. Art. 1266(2)(a) - In line 4, delete "the senior medical officer direct." and substitute therefor "the medical officer or the dental officer direct."

Page 380. Art. 1287(11) - In line 2, change "seven" to "eight". Between lines 8 and 9, insert "(g) Dental department.". Before "Supply department" change "(g)" to "(h)". In line 1, at top of page 381, insert "the dental officer" between "officer," and "and".

Page 416. Art. 1393 - In line 5, between "medical stores," and "Marine Corps stores", insert "dental stores,". In line 6, insert comma after "stores" and insert "dental stores" between "stores" and "and". In line 7, insert comma after "medical" and insert "dental" between "medical" and "and".

Page 469. Art. 1516(1) - In line 4, delete "and" before "medical"; delete the period after "medical department" and add "and dental department."

Page 471. Art. 1518(1) - Insert in proper sequence:

"(j) Dental department. - The dental officer; he shall be the officer of the Dental Corps detailed for this duty."

Page 481. Immediately following article 1541, insert the following:

"SECTION 17A - DENTAL OFFICER

"1541A

"The dental officer of a naval shipyard shall be governed by the provisions of Chapter 32, Navy Regulations."

Page 516. Art. 1608 - In line 1, between "supplies" and "pertaining", insert "and equipment". In line 2, between "medical" and "officers", insert "and dental".

(Not Restricted)

Page 517. Art. 1616 - In line 2, insert comma after "Surgery". Between "Surgery," and "shall", insert "except those for use in the dental department,".

Page 525. Art. 1637(1) - In line 3, delete "standard medical or" and substitute "approved".

Page 525. Art. 1637(2) - Revise to read as follows:

"(2) The professional board shall consist of three officers of the Dental Corps."

Page 556. Art. 1713(1) - At end of paragraph add new sentence as follows: "When the enlistment is for a dental technician rating, a dental officer, if available, shall conduct the professional examination."

Page 594. Art. 1819(1) - Insert line 17 as follows:
"(m) Dental officer."

Page 730. Chapter 54. Under Sec. 9(b), in lines 5 and 6, delete "NAVMED K-DENTAL" and reference thereto.

Page 731. Chapter 54. Under Sec. 9(d), in lines 7 and 8, delete "NAVMED L-DENTAL" and reference thereto.

Page 734. Chapter 54. After "Sec. 15.", insert the following:
"Sec. 15A. REPORTS FROM DENTAL OFFICERS
(See Manual of the Medical Department)".

J. L. McCrea

JOHN L. McCREA
Deputy Chief of Naval Operations (administration)